

C.) REMARKS

The Office Action mailed October 12, 2006 has been received and carefully considered. Upon entry of the present amendments, claims 19-23 and 25-37 will be pending. In the Office Action, claim 24 is rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,448,443 to Muelleman (Meulleman); claims 25-27 are rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 3,579,041 to Paine (Paine); and claims 19-23 and 28 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Paine in view of W.O. Patent No. 86/02786 to Ahuja (Ahuja).

Amendments to the Specification and Claims

Claims 19, 25-26 and 28 have been amended. Claim 24 is cancelled without prejudice. Claims 29-38 have been added. Support for the amendments and new claims are found throughout the specification as originally filed; no new matter is presented. Specifically, support for amended claim 19 can be found in at least paragraph [0137] of the specification, and support for amended claims 25 and 26 and newly added claims 29-37 can be found in at least paragraphs [0013], [0134]-[0138], [0142], [0147], [0147], [0151], and [0157]-[0158] of the specification.

Rejection under 35 U.S.C. § 102(b)

a. 35 U.S.C. § 102(b) over Muelleman

Claim 24 currently stands rejected under 35 U.S.C. § 102(b) as anticipated by Muelleman. Claim 24 has been cancelled without prejudice, and therefore renders this rejection moot.

b. 35 U.S.C. § 102(b) over Paine

Claims 25-27 are rejected as being obvious over Paine. Applicants respectfully traverse the rejection.

Specifically, the Examiner stated that

§ Claims 25-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Paine
(US 3,579,041).

With respect to claim 25, Paine discloses a control circuit (figure 1, item 10; column 1, lines 29-33) including:

at least two input terminals (figure 1, item 11; column 3, lines 58-60) for electrically connecting with a power source;

at least two output terminals (figure 1, item 12; column 3, lines 58-60) for electrically connecting with a load;

a switching relay (figure 1, item 20; column 1, lines 45-64) having a switching coil (figure 1, item 21) that is selectively energized to progress the relay between two modes wherein: in one of the modes the input and output terminals are respectively electrically connected for allowing the load to receive power from the source via the switching relay; and in the other mode the input and output terminals are electrically disconnected for preventing the source from supplying power to the load via the switching relay (column 1, lines 14-18); and

a sensor relay (figure 1, item 30; column 1, line 65 to column 2, line 4) that is responsive to a predetermined condition for energizing the coil of the switching relay.

With respect to claim 26, Paine discloses the control circuit according to claim 25, and further discloses the sensor relay has a low voltage coil that is energized in response to the fault condition (figure 1, item 31; column 1, lines 72-73).

With respect to claim 27, Paine discloses the control circuit according to claim 26, and further discloses the low voltage coil is energized by a DC voltage (figure 1, item 11). The sensing coil is connected to the input DC voltage node.

The examiner is reminded that “[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.’ *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).” *See* Manual of Patent Examining Procedure, 8th Edition (MPEP), Section 2131.

In addition, “[t]he identical invention must be shown in as complete detail as is contained in the ... claim.’ *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).” *See* MPEP, Section 2131.

Paine, as understood, is directed to a fundamentally different approach to electrical protection than that is provided by the embodiments of the present invention. Particularly, Paine is concerned with monitoring over-current conditions as a means for detecting a fault. Paine teaches a device in the form of a relay circuit breaker (10) that disconnects a load from a power source. Paine teaches a load (12) and a circuit breaker (10) that includes two relays, a switching relay (20) and a sensing relay (30). The switching relay (20) includes two coils (21, 22) and the sensing relay (30) includes two coils (31, 32). One of ordinary skill in the art would appreciate that the term 'coil' is substantially equivalent to the term 'solenoid' as used in Paine. The circuit breaker (10) includes four coils, and requires all four coils to operate. When the load current flowing through the conductor (46) is "considered excessive" (*See Paine*, col. 3: 1-2) the coil (32) energises the armature (33) to contact with a relay contact (35). This subsequently causes the coil (22) to energise and switch the armature (23) to the relay contact (24) thereby electrically disconnecting the source from the load. The coil (31) is then energized, resulting in the armature (33) contacting with the relay contact (34) and subsequently de-energising the coil (22). Coil (31) will remain energized until the fault condition is removed and circuit breaker (10) is operating under normal conditions. Under those normal operating conditions, coil (21) is energized and remains energized, and coil (32) is at least partially energised. That is, the operation of the circuit is dependant upon the energizing and de-energising of all four coils.

In contrast, independent claim 25, as amended, recites a control circuit (15) having a sensor relay (19) and a switching relay (22). The sensor relay (19) has only one coil (a sensor coil (25)) and the switching relay (22) has only one coil (a switching coil (44)). When in the normal operating condition, in the absence of a fault, neither coil (25, 44) is energised. It is only when a fault condition is detected that the two coils are energised. However, once the switching coil (44) is energized, and the associated relay (22) progresses to the other mode, the load and the source are electrically disconnected which, in turn, quickly results in coil (25) being de-energised. Following that, only one coil, coil 44, is energised. Once the fault has been removed and normal operating conditions re-established, both coil 25 and coil 44 are de-energised.

The operation of the present invention in independent claim 25 as described in detail above is significantly different to the operation of the system of Paine. The limitations of the invention as recited in claim 25 are not taught or suggested by the Paine. First, Paine recites

having a maximum of four coils energised or de-energised and recites both relays being magnetic latching relays and not conventional relays having only single coils, as recited in independent claim 25 of the present invention. The present invention recites a maximum of two coils to be energised or de-energized. The use of a single coil in the present invention in the switching relay results in a less complex construction of the embodiments of the invention and produces a system that has a more beneficial and desirable size, is more reliable, consistent, serviceable, and cheaper to operate and manufacture. In addition, Paine is directed to a fundamentally different approach to electrical protection by having a maximum of 4 coils, having 2 non-conventional relays, each having 2 coils, wherein the invention as recited in claim 25 recites the use of 2 conventional relays, each having one coil, thereby providing electrical protection by reciting the use of a maximum of 2 coils. Further, Paine teaches monitoring the over-current conditions as a means for detecting faults, while the present invention operates independently of load current conditions and instead senses reference voltage. As a result of sensing reference voltage instead of load current conditions, the present invention operates more quickly and more consistently and detects faults other than over-current conditions.

Applicant submits that dependent claims 26 and 27 are distinguishable from Paine for at least the following reasons. To begin, dependent claims 26 and 27 are believed to be distinguishable from Paine as depending from what are believed to be allowable independent claim 25 as discussed above. Furthermore, there is nothing in Paine that teaches or suggests any of the limitations in dependent claims 26 and 27.

Therefore, in view of the above, dependent claims 26 and 27 are believed to be distinguishable from Paine and therefore are not anticipated nor rendered obvious by Paine. In conclusion, it is respectfully submitted that claims 25-27 are not anticipated nor rendered obvious by Paine and are therefore allowable.

For at least these reasons, the rejection of claims 25-27 is improper and should be withdrawn.

Rejection under 35 U.S.C. § 103(a)

Claims 19-23 and 28 are rejected as being obvious over Paine in view of Ahuja.
Applicants respectfully traverse the rejection.

Specifically, the Examiner stated that

7. Claims 19-23 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paine in view of Ahuja (WO 86/02786) from applicants' Information Disclosure Statement.

With respect to claim 19, Paine discloses a control circuit (figure 1, item 10; column 1, lines 29-33) including:

at least two input terminals (column 3, lines 58-60) for electrically connecting with a power source;

at least two output terminals (column 3, lines 58-60) for electrically connecting with a load;

a sensor (figure 1, item 26; column 1, line 65 to column 2, line 4) having a sensor relay that is energized in response to a reference signal being within a predetermined range, wherein the sensor provides a sensor signal in response to the sensor relay being energized; and

a switching device (figure 1, item 20; column 1, lines 45-64) having a switching relay that is responsive to the sensor signal for progressing between a first mode and a second mode wherein: in the first mode the input and output terminals are respectively electrically connected for allowing the load to receive power from the source via the switching relay; and in the second mode the input and output terminals are electrically disconnected for preventing the source from supplying power to the load via the switching relay (column 2, lines 9-11).

Paine disclose that the control circuit may be used in a three-phase A.C. system. It is inherent in an AC system that there would be at least two input terminals and two output terminals to conduct the full A.C. waveform.

Paine does not expressly disclose the sensor reference signal being derived from a voltage differential between one or more of the conductors and a reference point that

is electrically isolated from the conductors when in use.

Ahuja discloses a control circuit having at least two input and two output terminals, and a switching relay (item 16; abstract). Ahuja further discloses a current sensing device (item 15) that generates a voltage signal that is proportional to the current. The voltage differential created by the sensor (15) is inherently judged against a reference point (voltage "potential"), and it would be obvious to one skilled in the art that the reference point would be earth ground.

At the time of the invention by applicants, it would have been obvious to one skilled in the art to combine the control circuit disclosed in Paine with the voltage potential sensor disclosed in Ahuja.

The motivation for doing so would have been to protect the sensor for an over-current by sensing a voltage value (Ahuja abstract, lines 1-3).

With respect to claim 20, Paine and Ahuja disclose the circuit according to claim 19. Paine further discloses the sensor relay senses the DC input voltage that is protected against voltage surges (figure 1, item 31; column 2, lines 37-48), but does not expressly disclose the sensor relay is a low voltage DC relay. It would have been obvious to one skilled in the art to substitute a low voltage DC relay in place of the Paine sensing relay, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233 (CCPA 1955).

With respect to claim 21, Paine and Ahuja disclose the circuit according to claim 20, and Paine further discloses the switching relay is a mains voltage relay (column 1, lines 45-47).

With respect to claim 22, Paine and Ahuja disclose the circuit according to claim 20. Paine discloses an improvement over the prior art control circuit that comprises a DC voltage relay (column 1, lines 51-53).

With respect to claim 23, Paine and Ahuja disclose the circuit according to claim 19, and Paine further discloses the sensor signal is an AC signal or derived from an AC signal (column 3, lines 58-60).

With respect to claim 28, Paine discloses the control circuit according to claim

27, and further, it would be obvious to one skilled in the art to have the low voltage coil energized by a DC voltage of greater than 1 volt, because it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 216 (CCPA 1980).

Paine, as understood, is directed to a fundamentally different approach to electrical protection that monitors over-current conditions as a means for detecting a fault, as described in greater detail above.

Ahuja, as understood, is directed to a device in the form of an auto-reset circuit breaker (10) that disconnects a load (14) from a source (12) by detecting the voltage across a resistor (18) through which the load current flows. The circuit breaker (10) is an over-voltage/over-current auto-reset circuit breaker (*See Ahuja*, page 5: 20-21). Circuit breaker (10) is intended to detect an over-voltage and an over-current at the load (10) and to do so teaches the use of a resistor (18) to measure load current and a detector (34) to measure the voltage differential between a neutral point and a point that in normal use is active.

Independent claim 19, as amended, recites a control circuit having at least two input terminals for electrically connecting with a power source, at least two output terminals for electrically connecting with at least two conductors of a load and a sensor. The sensor has a sensor relay that is energized in response to a reference signal being within a predetermined range that is derived from a voltage differential between one or more of the conductors and a floating reference point that is electrically isolated from the conductors when in use. The sensor also provides a sensor signal in response to the sensor relay being energized. The control circuit as recited in independent claim 19 also has a switching device with a switching relay that is responsive to the sensor signal for progressing between a first mode and a second mode. In the first mode, the input and output terminals are respectively electrically connected for allowing the load to receive power from the source via the switching relay; and in the second mode, the input and output terminals are electrically disconnected for preventing the source from supplying power to the load via the switching relay.

Furthermore, “[t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art suggests the desirability of the

combination.” See Manual of Patent Examining Procedure, 8th Edition (MPEP), Section 2143.01.

The Examiner is reminded that “[i]f the proposed modification or combination of the prior art would change the principle or operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious.” See MPEP, Section 2143.01.

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). “All words in a claim must be considered in judging the patentability of that claim against the prior art.” *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

See Manual of Patent Examining Procedure, 8th Edition (MPEP), Section 2143.03.

First, Paine and Ahuja recite a device that in order to operate, must sense the load current of the relevant load being protected. In contrast, the present invention is able to operate independently of load current and senses reference voltage levels. In addition, the invention of claim 19 recites a system that is not specifically concerned with detecting either an over-voltage or an over-current condition, but recites a system that detects whether or not there is a voltage at a reference point which, in use, is "electrically isolated from the conductors" as recited in the invention of claim 19. Ahuja actually teaches away from a reference point, which, in use is "electrically isolated from the conductors". Further, the present invention operates independently of the load current by having regard to a voltage differential between one or more of the conductors and a floating reference point as specifically recited in independent claim 19. The floating reference point of the present invention is electrically isolated from the conductors when in use, and the voltage does not need to be derived from the load current. One of ordinary skilled in the art would appreciate that it is possible for no load current to be flowing for the control circuit of the present invention to detect a voltage differential and trigger a fault condition. In contrast, Ahuja teaches a system that only operates after a person has caused sufficient load current to flow through the circuit such that a predetermined threshold is exceeded.

Applicant submits that dependent claims 20-23 and 28 are distinguishable from the combination of Paine and Ahuja for at least the following reasons. To begin, dependent claims

20-23 and 28 are believed to be distinguishable from Paine and/or Ahuja as depending from what are believed to be allowable independent claim 19 as discussed above. Furthermore, there is nothing in Ahuja that teaches or suggests any of the limitations in independent claim 19 not taught or suggested by Paine.

Therefore, in view of the above, dependent claims 20-23 and 28 are believed to be distinguishable from Paine and/or Ahuja and therefore are not anticipated nor rendered obvious by Paine and/or Ahuja. In conclusion, it is respectfully submitted that claims 19-23 and 28 are not anticipated nor rendered obvious by Paine and/or Ahuja and are therefore allowable.

Other matters.

New claims 29 and 30 are added to depend from claim 25 and are believed to be allowable at least for the reasons that claim 25 is allowable.

D.) CONCLUSION

Accordingly, for at least these reasons, Applicants respectfully request that the Application be allowed and passed to issue. In the event any outstanding issues remain, Applicants would appreciate the courtesy of a telephone call to Applicants' undersigned representative to resolve such issues in an expeditious manner.

This Amendment/Response has been filed within four months of the mailing date of the Office Action and it is believed that the only fee due with the filing of this paper is an additional \$120 for a one-month extension of time. In the event that Applicants are mistaken in their calculations, the Commissioner is authorized to deduct any fees determined by the Patent Office to be due from, or credit any overpayment to, the undersigned's Deposit Account No. 50-1059.

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Respectfully submitted,

MCNEES WALLACE & NURICK LLC
Attorneys for Applicants

By:

/Beth A. Endler/

Beth A. Endler, Reg. No. 59,295
P.O. Box 1166
100 Pine Street
Harrisburg, Pennsylvania 17108
Direct Dial: (717) 237-5376
Facsimile: (717) 237-5300